

It is claimed:

1. A gain control system, comprising:

a variable amplifier that receives a control signal and an input signal, the variable amplifier being operable to apply a gain to the input signal to generate an output signal, wherein the gain is a function of the control signal;

a summation module that combines a gain reference signal and a gain variation signal to generate the control signal;

the gain reference signal being calibrated at a reference temperature and a reference frequency; and

a gain calibration module that outputs the gain variation signal as a function of a current operating temperature and a current operating frequency.

2. The gain control system of claim 1, wherein the gain calibration module is a two-dimensional mapping module that stores a two-dimensional array of gain variation values and uses the current operating temperature and current operating frequency to interpolate the gain variation signal from the two-dimensional array of gain variation values.

3. The gain control system of claim 1, wherein the gain calibration module includes a two-dimensional array and a fast access vector, the fast access vector being interpolated from the two-dimensional array at the current operating frequency and the gain variation signal being interpolated from the fast access vector at the current operating temperature.

4. The gain control system of claim 1, further comprising a temperature sensor that monitors the current operating temperature.

5. The gain control system of claim 1, further comprising:

a digital-to-analog converter coupled between the variable amplifier and the summation module, the digital-to-analog converter being operable to convert the control signal from the digital domain into the analog domain.

6. The gain control system of claim 1, further comprising:

a low pass filter coupled between the variable amplifier and the summation module operable to filter high frequency transients from the control signal.

7. The gain control system of claim 1, wherein the variable amplifier is a voltage-controlled amplifier and the gain is a function of a voltage of the control signal.

8. A method for controlling gain compensation over temperature and frequency variations, comprising:

determining a gain reference, the gain reference being calibrated at a reference temperature and a reference frequency;
determining a current operating temperature;
determining a current operating frequency;
determining a gain variation as a function of both the current operating temperature and the current operating frequency;

combining the gain reference and the gain variation to generate a control signal; and using the control signal to control a gain applied to an input signal.

9. The method of claim 8, further comprising:

storing a two-dimensional array of gain variation values, a first dimension corresponding to temperature values and a second dimension corresponding to frequency values; wherein the gain variation is determined from the two-dimensional array.

10. The method of claim 9, further comprising:

interpolating a fast access vector from the two-dimensional array using the current operating temperature; storing the fast access vector; and interpolating the gain variation from the fast access vector using the current operating frequency.

11. A mobile communication device, comprising:

a communication subsystem operable to send and receive electronic messages over a communication network; a memory subsystem operable to store data and program information; and a processing subsystem operable to store and retrieve data in the memory subsystem, execute programs stored in the memory subprogram, and cause the communication subsystem to transmit and receive electronic messages over the communication network; the communication subsystem including:

a variable amplifier that receives a control signal and an input signal, the variable amplifier being operable to apply a gain to the input signal to generate an output signal, wherein the gain is a function of the control signal;

means for combining a gain reference signal and a gain variation signal to generate the control signal, wherein the gain reference signal is calibrated at a reference temperature and a reference frequency; and

means for generating the gain variation signal as a function of a current operating temperature and a current operating frequency.